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THE TEACHING OF PHILOSOPHY AND THE CLASSIFICATION OF THE SCIENCES IN THE THIRTEENTH CENTURY.[1]

IN the thirteenth century there was a great philosophical movement. Its apogee coincides with that of the University of Paris and, indeed, with the highest point of all mediæval civilization. We are beginning to be better acquainted with mediæval philosophy; some remarkable works have been devoted also to the organization of the University of Paris in its time of splendor; and studies in the realms of politics, economics, and the history of customs and of art in all its forms help us daily to penetrate farther into the civilization of the thirteenth century.

This is, however, a kind of research which has scarcely been touched and which is rich in possibilities; for example, there is the question of the relationships between the various factors—the philosophical doctrines themselves, the University within which they evolve, and the civilization in which they are immersed. Indeed, the evolution of philosophical doctrines—what I would call the internal life of philosophy—commands in a sense the external life of the great mediæval university, and still more, reflects and acts upon the whole civilization of the period. The general question which I propose to discuss is, in a word, this: *The philosophical program of the University of Paris is closely affiliated with a classification of human knowledge which was accepted by all the scholars of the thirteenth century; and this classification has sociological features which bring it into harmony with the entire civilization of that century.*

I. The Philosophical Program of the University of Paris in the thirteenth Century.

The founding of the University of Paris in the last years of the twelfth century constituted a turning-point in the history of mediæval philosophic thought. After that the French metropolis was to monopolize to its advantage the intellectual activity which had previously been scattered about in numerous French centers. The University eclipsed the episcopal and monastic schools, and thereby killed the individualistic spirit in favor of a centralization of study.[1]

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[1] Translated from the French by Dr. Katherine E. Gilbert.

Toward the middle of the twelfth century the schools of Paris were divided into three groups: (*a*) the schools of the cathedral of Notre Dame, under the authority of the chancellor, and through him, of the Bishop of Paris; (*b*) the schools of the canons of St. Victor, which had become a hot-bed of mysticism, but where William of Champeaux had opened an outside school and had been teaching philosophy for some time; (*c*) the outside schools of the abbey of Saint Genevieve. But the schools of Notre Dame occupied the foremost place, and it was from them that the University sprang, not indeed through a decree of the government or a committee of trustees, but as a flower grows from its stem, by a natural association of masters and pupils; for their number had multiplied as a result of the constant development of studies.

Masters and pupils were grouped in four faculties according to their special interests—the University documents compare them to the rivers of Paradise, just as the iconography of the cathedrals symbolically represents the four evangelists as pouring water from urns toward the points of the compass. These are the faculties of theology, arts (thus called in memory of the liberal arts of the High Middle Ages), of law, and of medicine. The first two established the fame of Paris and attracted to her lecture-halls all the scholars of the West interested in theology and philosophy. The infatuation for philosophy which now appeared, culminated in a flowering of systems so varied, so opposed to each other, and so powerful that the thirteenth century stood out definitely as one of the most significant in the history of thought.

The organization of disciplines in the University is a living and moving thing. It takes form in the second half of the thirteenth century, and at that moment shows in great purity of outline, like something new and fresh, like a distinctive and pleasing product of the Middle Ages.

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[1] See Rashdall's excellent work. *The Universities of Europe in the Middle Ages.* Oxford, Clarendon Press, 1895.

I should like, as it were, to take a snap-shot of the faculty of arts—or of philosophy—as it is about 1270, in order to put in concrete form the organization of its curriculum.

At first it is entirely distinct from the other faculties, therefore from the faculty of theology also, just as philosophy at the present time is distinct from theology. But the studies under its control fill a quite special place in the University economy because they are the usual or even required preliminary to studies in the other faculties. They have a formative and preparatory character, and for this reason the faculty of arts appears in the documents with the title of inferior faculty, *facultas inferior*, in distinction from the three other faculties which are placed over it and hence are called superior, *facultates superiores*.[1] On this account the student population of the faculty of arts was young and numerous, a population of adolescents—*pueri*, the charters say. They entered at fourteen years; at twenty they might have finished their course in arts and have graduated into another faculty. But they had received the imprint of their masters, and at this fine time of youth the impress is indelible. On their side, the masters or professors of the faculty of arts, recruited from among the graduates in arts by a curious custom of which we will speak later, also formed the young—and therefore stirring—element in the professorial body.

It is easy to distinguish in the faculty of arts the two main features which characterize the entire University: the corporate spirit and the extension of instruction.

The faculty of arts is an incorporated association of masters, *magistri*, and pupils; it works out its own laws, owns its own seal, elects its own dean, and only admits new members into the fold after a solemn initiation. It is, to be sure, an outsider—the chancellor of the cathedral of Notre-Dame—who, in the name of the bishop and because of tradition, gives the *license* to teach, *licentia docendi;* but the masters of the faculty have to welcome and initiate (*inceptio*) this new member if he is not to remain a stranger to the corporation. The number of masters of arts thus incorporated is considerable. Practically, it is unlimited—for a reason that we shall mention. Indeed, the *student* at Paris is an *apprentice-professor*, a candidate for the mastership. His career is normally crowned, not by receiving a diploma—which is simply the recognition of knowledge,—but by *teaching* in the corporation of his masters. The studies too are simply a long apprenticeship for the mastership or the professorship. He becomes a professor by doing the work of a professor, as a blacksmith becomes a blacksmith by forging. Indeed, in spite of oneself, one is reminded of the organizations of workmen, of stonecutters and masons, who about this time were building and carving the great cathedrals of France. They too had their working-men's syndicates, and professional schools were organized in their midst. The apprenticed workman was subjected to a severe and long initiation, and worked under the direction of a master. To become master in his turn he had to produce a work judged worthy and called a *masterpiece*. The process was not otherwise for the future professors of philosophy (and of theology) at the Parisian University.

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[1] Demple et Chatelam, *Chartularium Universitatis Parisiensis*, I, p. 600.

After six years of attendance as pupil, the new member cleared the three steps of baccalaureate (*bacchalaureus*), licentiate (*licentiatius*), and mastership (*magister*). But the tests for the baccalaureate had already included an attempt at a public lesson. After the new member had been subjected to some preliminary examinations (*responsiones et examen*), he was required to mount a platform, and invited to organize the defense of a thesis—a process which sometimes lasted all though Lent—and to answer the objections of those present. This public defense was called *determinatio* (*determinance*); and the student left it a bachelor. The very term was employed by the corporation in a special sense,—the bachelors, in the language of the profession, being "those who have passed as masters in the art but who have not been sworn in." The examination for the baccalaureate is surrounded with the corporate ceremonial so dear to the thirteenth century. The student puts on a special *cap*. Then, the seance ended, wine is served and a banquet arranged. Youth is everywhere the same—the great days of university life must be gaily celebrated. Between the baccalaureate and licentiate there ran a time of variable length during which the bachelor was at once student and apprentice-professor. As student, he followed the master's lessons and continued to acquire knowledge; as apprentice-professor, he himself explained to others some books of Aristotle's *Organon*. When his term of six years had rolled around and he had reached his nineteenth or twentieth year, the bachelor could present himself before the chancellor to be admitted to the *licentiate*. Ceremonies multiply; a new examination to be gone through with before some of the professors of the faculty (*temptatores*), then before the chancellor assisted by four examiners chosen by him and agreed upon by the faculty, public discussion at *St-Julien-le-Pauvre* upon a subject left to the choice of the bachelor, finally amid great pomp the conferring of the long-coveted right to teach and open his own school. There was still the third step to be mounted—the mastership, and here we are taken back to the purest conceptions of the mediæval corporation. The mastership is the enthroning of the newly licensed member within the faculty or society of masters—that close organization, so jealous of its monopoly, to which one had access only through the agreement of all the members, and after having given a pledge of fidelity to the rector and to the faculty—a pledge which bound the master for life. The mastership was in principle *a free profession*, with no rules except the rules applying to the organization as a whole, and with no limit upon the number of the members. If one adds that the students chose the master that pleased them, it will be understood that the value of the teaching determined the prestige of the doctors, and that there were deserted regions, and others—as in the time of Abelard—too small to hold the knowledge-seeking crowd.

But it is interesting to know what was taught and how teaching was conducted in the faculty of arts. What is the level of the studies? What is the philosophy of these masters worth? We know that masters and bachelors had to read (*legere*), that is, explain texts (in English the word 'lecture' is still applied to university instruction), and also organize discussions (*disputare*).

Here in all its dryness is the list of works *to be read*, as fixed upon in 1255 by a statute of the faculty of arts: "*Veterem logicum (videlicet Librum Porfirii, Predicamentorum, Peri Ermenias, Divisionum et Thopicorum Boecii, excepto quarto), Priscianum Minorem et Majorem, Topica et Elenchos, Priora et Posteriora; Ethicos quantum ad quatuor libros; Sex Principia, Barbarismum, Priscianum De Accentu; Physicam Aristotelis, Metaphysicam, et Librum De Animalibus; Librum Celi et Mundi, Librum Primum Metheorum cum Quarto; Librum De Anima; Librum De Generatione; Librum De Causis; Librum De Sensu et Sensato; Librum De Sompno et Vigilia; Librum De Plantis; Librum De Memoria et Reminiscentia; Librum De Differentia Spiritus et Anime; Librum De Morte et Vita.*"[1] The statute had its origin in the fact that certain professors cut their lessons short and did not devote to the teaching the time required by the abundance and difficulty of the material: *magistris aliquibus lectiones suas terminare festinantibus antequam librorum quantitas et difficultas requireret.* In the future the masters would be obliged to comment,—that is, to teach the long series of works which we have just enumerated.

All the recent historians have described these programs of courses and didactic methods; but no one, so far as I know, has sufficiently penetrated to their spirit. It is not enough to enumerate the different works which masters and bachelors were supposed to expound and comment upon; it is not enough to know that teaching had two phases, the '*lectio*' or commentary upon a text and the '*disputatio*' or public discussion between students, bachelors, and licentiates. What is more important is to grasp the organic and directing thought which determined the choice of this program, and the way in which the most brilliant masters of the period understood it. Then a light illumines from within the rigid scheme of the curriculum, and the cold skeleton becomes a living organism. The value and intensity of this life is clear to one who knows that these programs and methods were inspired by a vast classification of human knowledge; by a gigantic work of systematization, which reached its greatest perfection in the academic products of the Parisian University, but which began elsewhere, and which directed at the same time the parallel work of the schools of Moorish Spain or even of distant Byzantium. This great classification is like a forest of ideas, whose lofty tops dominate the mental life of the thirteenth century.

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[1] *Chartularium Universit. Paris.*, Vol. I, p. 278. *Cf.* p. 228 for a program which the English regard as less complete.

II. THE SCIENTIFIC STRUCTURE AND SUPERPOSITION OF STEPS.

The classification of human knowledge to which the curriculum of the faculty of arts is adapted is the fruit of several centuries of speculation and one of the characteristic conquests of the mediæval mind. For more than a thousand years it has satisfied thinkers thirsty for order and clarity. In what does it consist?

One may compare it to a monumental structure, to a pyramid of three steps: the sciences of observation at the base, philosophy half-way-up, theology at the top.

i. At the bottom are the experimental sciences of astronomy, botany, physiology, zoölogy, physics (in the modern sense of the word); and instruction in these precedes instruction in philosophy. In this there is a very interesting pedagogical application of a ruling principle in the philosophical ideology of the Middle Ages: viz., that since human knowledge is contained in the data of sensation, the cultivation of the mind must begin with what falls under the observation of the senses: *nihil est in intellectu quod prius non fuerat in sensu.* But more especially there is implied in this placing of the experimental sciences at the threshold of philosophy the beginning of a conception which inspires the scientific philosophies of all times: viz., that the *synthetic* or *total* conception of the world furnished by philosophy must be founded on an *analytic* or *detailed* conception yielded by a group of special sciences. These latter study the world minutely,—that is why they are called special sciences. They investigate the world piece by piece; the philosophers of the thirteenth century speak clearly concerning this method—the basis of the particularity of a science. This Aristotelian and mediæval theory of science appears in a brilliantly intellectualistic part of the history of method. It delighted H. Poincaré, and justifies his famous formula: "Science will be intellectualistic or nothing."

In all science, say the scholars of the thirteenth century, it is proper to distinguish the things with which it is concerned from the point of view from which they are considered. The things with which a science is concerned are its material; for example, the human body constitutes the material of anatomy and physiology. But every science grasps its material in its own way; it takes things on some one side, and this side is always *a point of view of the mind*, an aspect of things which the mind draws off,—abstracts (*abstrahit*) from its material. Thus the point of view of anatomy is not that of physiology; for anatomy describes the organs of the human body, while physiology is concerned with their *functions*. The point of view of the one is static, of the other is dynamic.

From this it very plainly follows that two sciences can be occupied with the same material, or—to borrow the philosophical terminology of the Middle Ages—possess a common material object (*objectum materiale*), but that they must possess in each case, under penalty of being confused, a distinct point of view, a unique formal object (*objectum formale*). And indeed, look at what groups of sciences you will, everywhere you will discover the operation of this law regulating the distinctions between the sciences: geology, inorganic chemistry, and physics are concerned with the same object—the inanimate world—but from different points of view. Biology, paleontology, anatomy, and physiology study the organism, but in its different aspects. The material common to political economy, civil law, and criminal law, is human action, but each of these sciences regards the complete reality of human action from a special angle. From this intellectualistic conception of the sciences, which rests the specific character of the science upon the point of view, it follows that a new science must be born every time researches and discoveries come upon a new aspect, a point of view hitherto unsuspected in the unending pursuit of reality; the more the mind multiplies its restrictions, the farther it penetrates into the secrets of the world.

This theory of science helps us to understand what makes a science 'special', and how a 'special' science is opposed to a 'general' science. The particularity of the sciences rests upon two considerations which supplement each other, and an examination of a few of the sciences that we have chosen as examples will suffice to show in the concrete the value of these considerations. Anatomy and physiology, we said, are concerned with the human body, but they do not disturb themselves about geological strata or stars or agreements and contracts. The material studied is a corner of reality; a restricted, specialized corner or—to use again the mediæval terminology—their material object (*objectum materiale*) is restricted. And precisely because anatomy and physiology are concerned with only a particular group of existences, the point of view under which they include this group of existences is not applied and is not applicable to other categories of the real.

ii. Suppose now that there is another order of sciences, which is not concerned with such and such a compartment of existences, but with all existences, with the real without restriction, and you will be in the presence of a general science. General science is philosophy, and it constitutes the second stage of knowledge. It is human wisdom (*sapientia*), science *par excellence*, ἐπιστήμη.

The detailed examination of the world for which the special sciences take up particular positions does not suffice to satisfy the mind; after the detail it demands total views. Philosophy is nothing but a glance at the whole of the world. The man of science resembles a stranger who should explore a city bit by bit, and travel through, one after the other, its avenues, promenades, museums, parks, buildings. When at last he had wandered over the city in all directions, there would still be another way for him to become acquainted with it; from the height of a platform, from the summit of a tower, from the basket of a balloon, from an aviator's seat, the city would disclose to him another aspect—its framework, plan, and relative disposition of parts. The philosopher is this man who views the world from the top of a look-out and sets himself to learn its structure; philosophy is a synthetic and general knowledge of things.

This *generality* strikes us in two ways; and in two ways the general character of philosophy is opposed to the special character of the other sciences. In the first place, instead of dealing with one compartment of the world, philosophy plunges into the immensity of the real, of all that is. Its matter (material object) is general, not, of course, in the sense of an encyclopedia (as was supposed by an Isadore of Séville, a Rhaban Maur, or a Vincent of Beauvais of the thirteenth century) into which is thrown pellmell and in a purely artificial order, a formidable lot of information in regard to all that is known and knowable. An encyclopedia is not a science and does not pretend to be. If philosophy deals with all reality it does so in a certain way: in total views.

But these total views are not possible unless the mind discovers in the totality of the real some aspects or points of view which are met with everywhere and which strike to the very depths of reality. To return to the technical language with which we are now familiar, its formal and precise object is *the study of the forms that are found everywhere and which must be general because common to everything.* The thirteenth century opens the door to the significance of synthesis or generality by taking up and completing Aristotle's famous division of philosophy, which was accepted as valid down to the time of Wolff in the seventeenth century: philosophy is first, *theoretical,* second, *practical,* third, *poetical,* that is to say, *actual.* This three-fold division of philosophy into speculative, practical, and poetic is based upon man's different contacts with the totality of the real, or as was said then, with the universal order.

1. Speculative or theoretical (θεωρεῖν, to consider) philosophy gives us the results of our acquaintance with the world in its *objective* aspect; it includes the philosophy of nature, mathematics, and metaphysics, which 'consider' respectively, in the material world, change, quantity, and existence. There are three stages through which the mind passes in order to secure a total view of the world of which it is spectator. The Middle Age defines physics or the philosophy of nature as the study of the material world in so far as it is borne away in change (*motus*). Change! Whether, indeed, it is a question of the inorganic kingdom or of the realm of the living, of plants or of human life, of

the atom or the electron, of the ion or of the course of the stars: all that *is* in the sensible world, *becomes*, that is to say, *changes*, evolves; or, to use the expression of the Middle Ages, everything is in motion (*movere*). To study in its intimate nature change and its implications, in order to explain through it the movements of the material world,—such is the task of the philosophy of nature.[1] It is easy to see that this study is of a regressive and synthetic kind, that it is general, that is to say, philosophical, on account of the general character of the material investigated (material object), and the generality of the point of view from which the inquiry is undertaken (formal object).

But through all their changes and transformations bodies preserve a common quality, the primary attribute of body—*quantity*—so that the study of *quantity* forces us to penetrate further still into the study of reality. *Mathematics*, which studies quantity as regards its logical implications, is for the ancients a philosophical and therefore general science, and in our day many scientists are tending to return to the Aristotelian notion.

2. The philosophical, that is to say, general, character of practical philosophy is no less apparent, although it is not concerned with the universal order in its objective reality, but with the activities of conscious life (πράττειν) through which we enter into relation with that reality. So that, as Thomas Aquinas explains, practical philosophy is occupied with an order of things of which man is at once spectator—since he examines it by turning upon himself—and maker, since he forms it through his conscious functions.

These great functions are *knowing* and *willing*. Logic sets up a scheme of all that we know, of the method of constructing the sciences; and there is nothing that the human mind cannot know in some imperfect way. *Ethics* studies the realm of our acts, and there is nothing in human life that cannot become the material of duty. *Politics* is concerned with the realm of social institutions, and there is nothing which has not on some side this social character, since man is made to live in society (*animale*

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[1] Since man is a part of the world of sense-perception, psychology belongs under physics.

sociale). Going more deeply into the analysis of 'practical philosophy,' one might show that logic draws in its train speculative grammar, for it invades grammar and rhetoric—its former associates in the trivium—to draw thence some food for controversy. Paris saw the birth of some true philosophies of language in the speculative grammars of Siger de Courtrai and of Duns Scotus; and the lexicographical codes of Donatus and Priscian which satisfied the twelfth century were at last scornfully rejected. Logic, ethics, and politics all claim to be in touch with the immensity of the reality with which man enters into relation.

3. The same quality of universality should pertain to the third group of philosophical sciences, the *poetical* (from ποιεῖν, to create) sciences, which study the order achieved by man externally through the guidance of reason. Man is at once the spectator and maker of an order he creates; but the order is outside of him, in matter, no longer within him. This third group is the least developed of all. It would seem as if the human product *par excellence, the work of art,* should here occupy a large place. There is nothing about it. By a strange omission the thinkers of the thirteenth century who reflected upon everything, did not reflect upon the human activity which inspires epics, makes cathedrals rise, stained windows flame, granite statues live. Dante is perhaps the only one who defined the work of art from an æsthetic point of view, when he called it "the grandson of God."[1] On the contrary, professional philosophers drown their speculations on beauty in metaphysical studies—and this explains the fragmentary character of their work. I cannot, however, refrain from noting how large and humane is the philosophy of art in the mediæval conception; there is no work of man that it cannot clothe in the royal mantle of beauty.

If now, in the light of what we have just said regarding the special sciences and philosophy, we take up again the list of books prescribed in 1255 for the course in arts we shall easily see that this program is drawn on the great lines of the classification of the sciences which we have just noted.

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[1] Inferno, XI, 103.

The special sciences first. From the old group of the liberal arts university instruction has preserved only dialectic, grammar, and astronomy. These three are represented by a considerable number of texts in which the masters found ample material for their personal commentary (Aristotle's *Vetus Logica* and the *Liber Six Principiorum*—works by Priscian and Donatus—*Liber Meteorum, Liber Celi et Mundi*). On the other hand, the addition of new material bursts the ancient framework, and scientific instruction, greatly enlarged, takes in physics (in the modern sense of the world), chemistry, botany, zoölogy, and human physiology (*De Olantis, De Animalibus, De Generatione, Liber De Sensu et Sensato, De Morte et Vita*). The abundant harvest of facts supplied by Aristotle and the Arabian commentators was enriched by fresh experimentation, as one can see by consulting the works of Roger Bacon, Albertus Magnus, Henri Bate, Richard of Middleton and many others. It is not clear how much this material got by observation and experiment is worth; but it is certain that all these facts were studied with the object of furnishing material for philosophy. There is at this time no science which is not envisaged as a road to philosophy. *Nulla est scientia quæ non sit aliqua philosophiæ pars.* To them all, one may apply what Albertus Magnus said regarding dialectic, that it is the *preambulum philosophiæ.* Thomas Aquinas, Godfrey of Fontaines and others borrow largely from special sciences which have no place in the curriculum of the faculty of arts, notably from medicine, and civil and canonic law. Facts about nature and man, about the physical and social man,[1] all parts of the kingdom of experience are called upon to feed the synthetic views of philosophy; and the faculty of arts might have been called with more truth the 'faculty of philosophy.'

Philosophy, indeed, occupies the largest and highest place in the curriculum. Theoretical philosophy is represented by two main works: *Physics* (Aristotle's *Physics*) and *Metaphysics* (Aristotle's *Metaphysics, Book of Causes*); and we already know that in the Greek and mediæval conception physics includes psychology. The latter occupies a place of honor through its treatment in Aristotle's *De Anima;* the books, *De Sensu et Sensato, De Somno et Vigilia, De Memoria et Reminiscentia, De Differentia Spiritus et Animi.* Practical philosophy is represented by the *Nichomachean Ethics* and by the *Logic* (*Logica Nova*). Logic is nicely distinguished from dialectic in that the former constitutes a true theory of science.

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[1] The facts have not been sorted out. The remarkable works of P. Duhem have pointed out the great scientific progress beginning in the fourteenth century and the germs of modern physical and mechanical theories.

iii. This ends the program of the faculty of arts, and it remains for us to say a few words regarding a third order of studies which is placed above philosophy and which corresponds, in the comparison that we have been making, to the highest part of a structure, to the top of the pyramid. This is *theology.* The part relating to dogma is an arrangement of doctrines founded upon the Bible. It is taught in another faculty, and we have shown elsewhere how the religious spirit of the time led almost all philosophers to concern themselves with theology, once their philosophical studies were ended.

These three orders of studies—the special sciences, philosophy, and theology,—although quite distinct, succeed and command each other; and it is to accentuate this hierarchical character that I have compared the whole structure to a kind of pyramid of three stages. The instruction at Paris merely reflects the results of three centuries of methodical labor. What is new in the thirteenth century is not the entire distinction between these three kinds of studies—that had been accepted since the end of the eleventh century—but it is the reflective and rational statement of the reasons for this autonomy; and this rests wholly upon the methodological theory given above, viz., that the point of view (*objectum formale*) from which a science considers its material (*objectum materiale*) is always distinctive. And in particular this is why concern with the same questions does not prevent philosophy and theology from being distinct and autonomous.

If one leaves theology out of account, one may say that the hierarchical relation of the special sciences and philosophy is of Aristotelian origin. The Aristotelian origin comes out in the very notion of a science which aims at unity, and in the relation between the sciences and philosophy. Since the latter rests upon the former, it remains in permanent contact with the facts and is anchored to the very rocks of reality. The Aristotelian inspiration appears finally in the inner articulation of philosophy itself. During the first centuries of the Middle Ages the Platonic division of philosophy into physics, logic, and ethics was for a long time in force. The thirteenth century definitely rejects it or rather absorbs it into new classifications. Compared with Aristotle—the most brilliant professor that humanity has ever known—Plato is only a poet, saying beautiful things without order or method. Dante was right when he called Aristotle "the master of those who *know*." But *to know* is before all things *to order: sapientia est ordinare:* the mission of the wise man is to put order into his knowledge. Even those who do not accept the ideas of the Stagyrite acknowledge his kingship when it is a question of order or clearness. "Three-quarters of mankind," writes Taine, "take universal notions for idle speculations.—So much the worse for them. Why does a nation or an age live except to form them? Only through them does one become completely human. If some inhabitant of another planet should descend here to find out how far our race had advanced, we would have to show him our five or six big ideas regarding the mind and the world. That alone would give him the measure of our intelligence."[1] To such a question the scholars of the Middle Ages would have replied by exhibiting their classification of knowledge, and they would have won glory thereby. Indeed, it constitutes a remarkable chapter in scientific methodology, a kind of 'introduction to philosophy,' to use a modern expression. Whatever may be one's judgment regarding the value of this famous classification, one must bow with respect before the great ideal that it aims to serve. It meets a need which periodically haunts mankind and which appears in all great ages: the need for the unification of knowledge. The thirteenth century dreamed of it as Aristotle and Plato did in ancient times, and as Auguste Comte and Herbert Spencer have in our day. It is a splendid product of greatness and power, and it is closely connected with the civilization to which it belongs.

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[1] *Le positivisme anglais*, pp. 11, 12.

III. THE SOCIOLOGICAL ASPECTS OF THE CLASSIFICATION OF THE SCIENCES.

In the thirteenth century these classifications of human knowledge held universal and undisputed sway. They have a cosmopolitan value. It is not a question here, as in the case of the work attempted by Ampère, Auguste Comte or Spencer, of personal and ephemeral notions, but of results accepted by all. From the middle of the twelfth century the Didascalicon of Hugh of St. Victor, the commentaries of Anticlaudianus and of Raoul de Longo Campo, and the anonymous authors of numerous manuscripts had tried to fix (with numerous individual modifications and variations[1]) the great lines of the Aristotelian classifications. But the time of groping is not slow to end. The treatise *De Divisione Philosophiæ* which Dominicus Gundissalinus wrote at Toledo under the inspiration of the great Arabic philosophers in the middle of the twelfth century opens a new and long series of works on the classification of the sciences. Robert Kilwardby who published about 1250 a special treatise on the origin and division of philosophy—*De Ortu et Divisione Philosophiæ*—one of the most remarkable introductions to philosophy produced in the Middle Ages—only perfected the outline made by Gundissalinus of Toledo. He introduces distinctions, adds details—according to his personal judgment—but invents nothing and does not pretend to. One finds the same classifications in all the writers of the period, in Robert Grosse-tête, Thomas Aquinas, St. Bonaventura, Siger de Brabant, Duns Scotus, Roger Bacon and others; they all run their knowledge into the same mold. Dante recalls these classifications at the beginning of his treatise *De Monarchia*. They do not exist merely in the organization of studies in the University of Paris, but one finds them also at Oxford and Cambridge—Universities whose philosophical influence goes on increasing up to the end of the thirteenth century. Furthermore, they are the basis of private instruction. I have found them in an unedited treatise (*Speculum divinorum et quorundam naturalium*) written toward the end of the thirteenth century by Henri Hate of Malines for the use of Count Gui de Hainaut, whose instruction he had undertaken. It is one of the rare pedagogical treatises of the thirteenth century written for the use of a lay prince. These classifications constitute the frames rather than the doctrines; and divergent philosophical systems, as for example, Thomism and Averroism, can be enclosed within them—as plants essentially different can grow in the same soil. They are as it were the atmosphere in which all the systems are immersed, the common mental life which hovers over systems and parts of systems. This age, so rich in individuality, knew no conflicts upon fundamental notions; there was agreement upon the points of departure. One does not see in the thirteenth century as in other periods of history one half of the thinkers systematically destroying the bases of discussion which the other half were trying to establish. Now this remarkable fact of general and international agreement is a prime sociological feature of the classification of the sciences, for it satisfies the profound aspirations of a time when men everywhere were dreaming of internationalism: of one science, one system of education, one faith, one morality, one Church, one learned and holy tongue, one temperament to distinguish the feudal nobility who were adopting in all countries the polite manners of France, one style of architecture—the architecture of the Gothic cathedrals which originated in Île de France and spread thence to England, Germany, Spain, and even Italy. It would pass the bounds of this study to show how the Crusades and the great development of commerce favored this expansion, and how the policy of the German Emperors and Popes, before it controlled all Christendom, was influenced by the idea of unity. Thus these things express the same notion as is found in the special sciences and in the scholastic philosophy dominant in the West, the doctrines of the latter being regarded as a common patrimony built up in the course of the centuries and enriched by the general contributions of society.

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[1] It happens in the twelfth century that the four branches of the quadrivium (astronomy, music, arithmetic, and geometry) are given as parts of mathematics, and more rarely that the material of the trivium (grammar, rhetoric, logic) are ranged under logic. Grabmann gives examples of this (*Geschichte der scholastischen methode*, 1911, II, pp. 37, 43, 45). There are isolated cases of the division of knowledge into *sapientia* and *eloquentia*—or into physics, theology, and jurisprudence. *Ibid.*, pp. 38, 46, 50.

One may add that the serenity and optimism so impressive in all the creations of the thirteenth century characterize also this work of classification. The Gothic cathedrals are hymns of joy; the statues, frescoes, windows, Dante's *Divine Comedy*, and St. Francis's *Little Flowers* are all illuminated with idealism; the economic and social awakening testifies to the universal confidence in the salutary effects of work, and this ardent faith doubles the value of the results both in the eyes of the common people and of the directors of the work. This same confidence breathes in the great trust in reason. Reason knows everything imperfectly; it knows something of everything; it proclaims aloud the value of that theoretical philosophy which puts us in touch with a reality outside of ourselves.

Finally, this classification of sciences made by the thirteenth century is touched with the religious spirit; to be convinced of this it is sufficient to consider the place of honor given to theology in the period as a whole and in university instruction. In this way also the classification harmonizes with the civilization of the time; for the age is everywhere marked with the imprint of religion.

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